Podium Plus Data Analysis Software

User Manual

SWIS10 Version

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1 Introduction

1.1 What is Podium Plus?

PolyLogic's Podium Plus Data Analysis Software enables data logged by the Farringdon Instruments SWIS10-3 steering wheel instrument system to be downloaded to a host PC and analysed in a variety of ways. Podium Plus also provides facilities for configuring the steering wheel instrument system via the serial port of the host PC.

With PolyLogic's Podium Plus Data Analysis Software you can:

- Download and store data logged by the Farringdon Instruments SWIS10-3
- Group related data together under common headings
- Display graphs of all logged channels plus gear ratio and time difference
- Overlay and compare lap data from different sessions
- Create a track map for each circuit visited
- Define segments for each circuit map
- Produce histograms of all logged channels plus gear ratio
- Produce X-Y plots of:
  - Wheel speed v engine speed (gear chart)
  - Lateral acceleration v longitudinal acceleration (traction circle)
  - User channel 1 v user channel 2
- Produce reports of:
  - Minimum and maximum values logged for a lap
  - Minimum and maximum speeds for each segment for a lap
  - Split times for all laps in a session
  - Summary of all laps in memory
- Produce hard copy output of all charts, reports and circuit maps
- Save screen layout for later use
- Configure the SWIS10-3 via the serial port of the host PC

1.2 About This Manual

This User Manual is intended to complement the help files built into the Podium Plus application. The chapters are presented in an order intended to help new users understand the program as quickly as possible. Be aware, however, that this manual and the program's help file assume that you are comfortable using the Microsoft Windows 98/2000/Me/NT4/XP operating system. If you are new to Windows you may find the Windows Online Help file useful. To access Microsoft Windows Help choose **Help** from the start menu on your Windows desktop.

1.3 Typographical Conventions

Please be aware of the following typographical conventions when reading this manual:

- Menu items that you are instructed to choose appear with an arrow (➡) symbol separating each menu level. For example, if you if you are instructed to choose the Download command in the File menu it will appear as **File ➡ Download**. If you are instructed to select the Track command from the Map Colours sub-menu in the Setup menu it will appear as **Setup ➡ Map Colours ➡ Track**.

- Where a button or other control needs to be clicked the name of the button or control will be shown in **bold** text.

1.4 Getting Technical Support

For technical support with Podium Plus please contact:

support@polylogic.co.uk

In addition, there are pages dedicated to support issues with PolyLogic's products on the PolyLogic web site.

The table below lists the ways to contact PolyLogic:

Contact Method	Address or Number
Website:	www.polylogic.co.uk
Telephone:	+44 (0) 1462 621066
Fax:	+44 (0) 1462 621066
Mail:	PolyLogic Limited 21 Cambridge Road Langford Biggleswade Bedfordshire SG18 9PR UK

2 Getting Started

Podium Plus is supplied on a CD-ROM. The CD-ROM also includes some sample data so you can start exploring the software straightaway.

2.1 System Requirements

Before attempting to install Podium Plus, make sure that your computer meets the following minimum system requirements shown in the table below:

Component	Requirement
Processor	Pentium class processor or equivalent
Operating System	Microsoft Windows 98/Me/NT4/2000/XP
Hard Disk Space	10Mb
System Memory	32Mb (64Mb recommended)
Other Drives	CD-ROM
Monitor/Display	Super VGA (800 x 600) or higher resolution with 256 colours
Serial Port	One serial port or USB port with USB-serial adapter
Pointing Device	Microsoft Mouse or compatible pointing device

2.2 Installing Podium Plus

Before you can run Podium Plus you must install it on the hard disk of your computer.

Follow these steps to install the software:

- Switch on your computer and log on in the normal way.
- Insert the Podium Plus CD into the CD drive. The Podium Plus Setup Wizard dialog will appear automatically.
- Click **Next**.
- Choose the installation folder for the software and click **Next**.
- Click **Next** again to complete the installation.
- Click **Close** once the installation is complete.
- The installation process places shortcuts to Podium Plus on the computer's desktop and Start menu.

NOTE: *If the Podium Plus installation process does not start automatically, you can start it manually by using My Computer or Windows Explorer to navigate to the contents of the CD and then double-clicking the file SETUP.EXE.*

2.3 Uninstalling Podium Plus

Podium Plus can be removed from your computer by selecting the **Add and Remove Programs** option within Windows **Control Panel**. Find Podium Plus in the list of installed software, select it, and then click **Remove**.

This will remove the Podium Plus software together with its shortcuts and configuration entries but all logged data, including the sample data provided on the installation CD, will remain on the hard disk of the computer.

2.4 Using Online Help

Once Podium Plus is running you can view items in the Help menu at any time. To display the online Help file press F1, choose **Help ➡ Topics,** or click the Help button on the main toolbar.

2.5 Starting Podium Plus

Start Podium Plus by either double clicking the shortcut on the computer's desktop or by selecting **Programs ➡ PolyLogic ➡ Podium Plus** from the **Start** button on the desktop's toolbar.

2.6 Selecting Data Logger

The first time that Podium Plus is run, the Select Data Logger Dialog (Figure 1) is displayed.

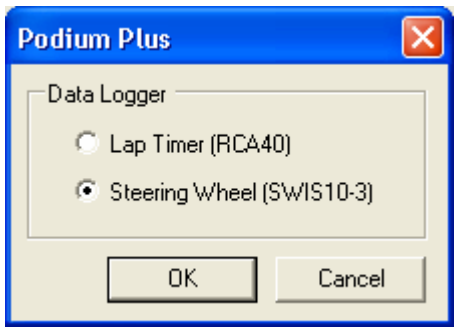


Figure 1 - Select Data Logger Dialog

Select the Steering Wheel (SWIS10-3) option and then click **OK**.

2.7 Licences

A licence is required to access certain features within Podium Plus such as downloading data from the data logger.

To enter the licence code supplied do the following:

1. Select **Help ➡ Licences** from the main menu, the Licence Details Dialog (Figure 2) appears.

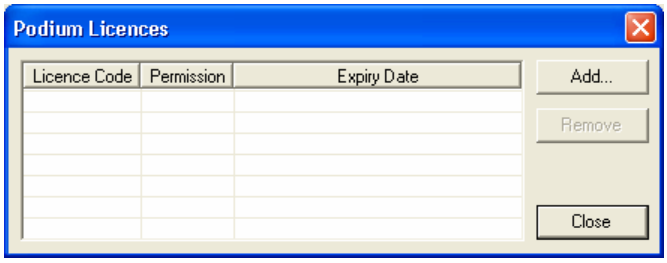


Figure 2 - Licence Details Dialog

2. Click **Add** to display the Add Licence Dialog (Figure 3), enter the licence code and then click **OK**.

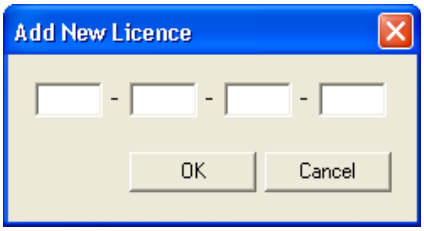


Figure 3 - Add Licence Dialog

2.8 Exiting Podium Plus

You can exit Podium Plus using any of the following methods:

- Choose **File ➡ Exit** from the main menu, or
- Click the close button ☒ in the upper right corner of the title bar, or
- Press the key combination Alt + F4.

3 Getting to Know Podium Plus

This chapter provides an overview of the Podium Plus user interface. It describes the main windows, menu, toolbars and other important features. To help you better understand the program and become familiar with its features, please review this chapter thoroughly prior to analysing any data.

3.1 Tour of the Podium Plus User Interface

When you start Podium Plus the main program window appears. This window is your work area and is divided up into sections where specific types of information are displayed.

The following screen shot shows the main program window during a typical session. The Lap Explorer and Notes window are displayed on the right hand side with four overlay graphs plotted on the left.

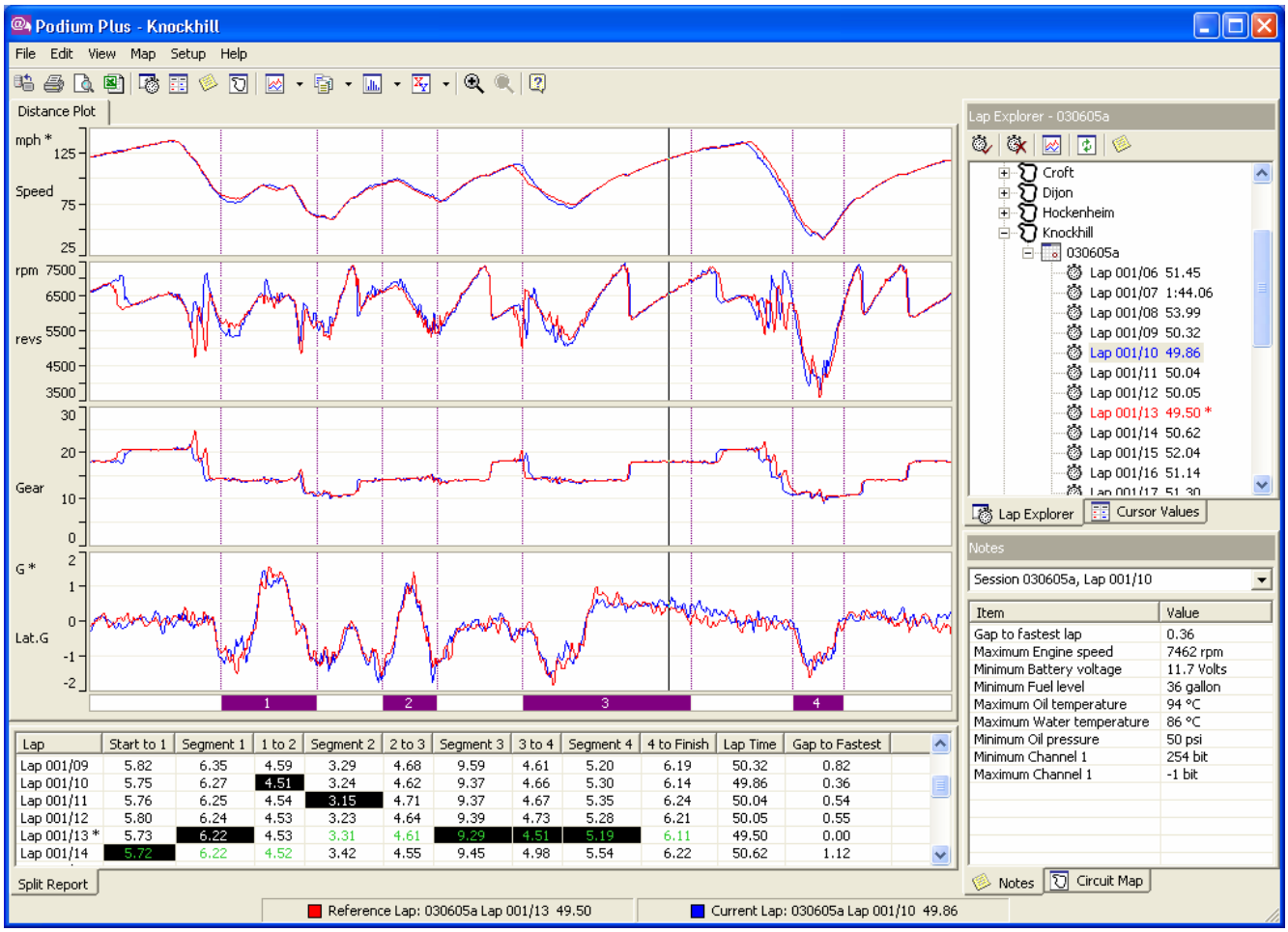


Figure 4 - Podium Plus Main Screen

At the top of the main program window a menu and toolbar provide access to a majority of the program's features.

A status bar at the bottom of the screen identifies the laps for which data is currently being displayed.

3.2 Main Menu

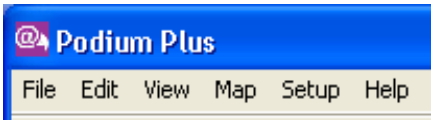


Figure 5 - Podium Plus Main Menu

The Main Menu (Figure 5), which is directly below the title bar, displays the menu headings. Click a menu heading to open the menu and choose a command.

Use either of the following methods to choose a menu command:

- Open the menu and click the command, or
- Open the menu, use the Up arrow or Down arrow key to highlight a command, and then press <Enter>.

In addition, each menu may be opened by pressing the <Alt> key and then pressing the key associated with the required menu. Section 3.14 lists all the available menu commands.

3.3 Main Toolbar

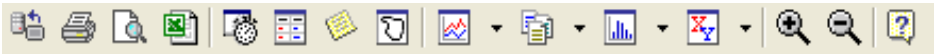


Figure 6 - Podium Plus Main Toolbar

The Main Toolbar (Figure 6), which is located directly below the Main Menu, contains buttons for accessing frequently used menu commands. To see the name of a button, place the cursor over it without clicking.

To execute the command associated with a toolbar button click the button. If a button is greyed out the command is not available. Section 3.14 lists the function of each of the toolbar buttons.

3.4 Lap Explorer

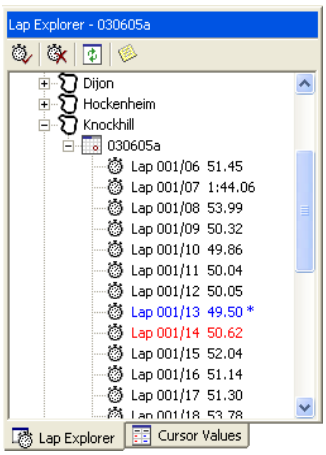


Figure 7 - Lap Explorer Window

The Lap Explorer window (Figure 7) displays the available data in a 'tree' or hierarchical manner.

This window is used to select the laps to be analysed.

Nodes are displayed for each circuit and session for which data exists. To expand a node either click on the ⊞ next to the node or double click the node's icon or text.

Once a node has been expanded it can be collapsed by either clicking on the ⊟ next to the node or double clicking the node's icon or text again.

If the Lap Explorer window is not currently visible it can be activated in any of the following methods:

- Click the Lap Explorer tab next to the Cursor Values tab, or
- Click the Lap Explorer button on the main toolbar, or
- Choose **View ➡ Lap Explorer** from the main menu.

The content of the toolbar below the window's title bar changes depending on the type of node that is currently highlighted as shown below:

Toolbar	Highlighted Node
	Root or circuit.
	Session.
	Lap.

To see the name of a button, place the cursor over it without clicking. To execute the command associated with a toolbar button click the button. If a button is greyed out the command is not available.

- Downloads data from data logger.
- Makes the highlighted lap the Reference Lap.
- Removes the Reference Lap.
- Refreshes the contents of the Lap Explorer window.
- Makes the Notes window visible.

3.5 Cursor Values

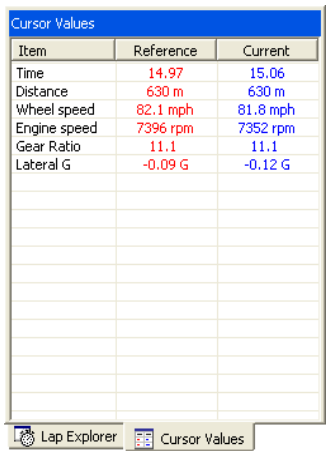


Figure 8 - Cursor Values Window

The Cursor Values window (Figure 8) displays the value of each graph at the current cursor position.

This window is used to compare parameters at any point on a lap.

The values change as the graph or map cursor are moved.

Time and distance are always displayed with other parameters being added when a graph for that parameter is selected.

Removing a graph removes that parameter from the list of parameters displayed in the Cursor Values window.

If the Cursor Values window is not currently visible it can be activated in any of the following methods:

- Click the Cursor Values tab next to the Lap Explorer tab, or
- Click the Cursor Values button on the main toolbar, or
- Choose **View ➡ Cursor Values** from the main menu.

3.6 Notes

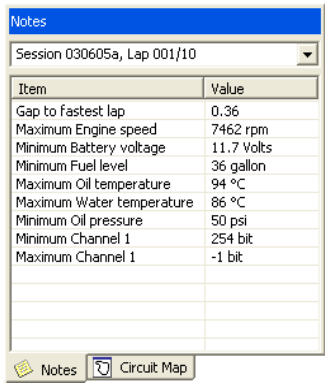


Figure 9 - Notes Window

The Notes window (Figure 9) displays additional information about the item currently highlighted in the Lap Explorer window.

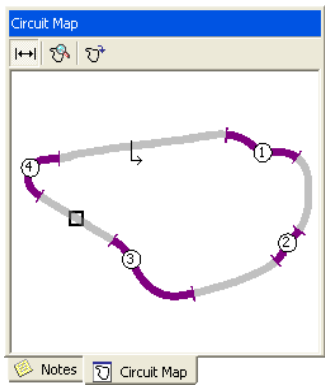
This window is used in conjunction with the Lap Explorer window to identify the laps to be analysed.

The list of information displayed depends on the type of node highlighted in the Lap Explorer node.

If the Notes window is not currently visible it can be activated in any of the following methods:

- Click the Notes tab next to the Circuit Map tab, or
- Click the Notes button on the main toolbar, or
- Choose **View ➡ Notes** from the main menu.

3.7 Circuit Map



The Circuit Map window (Figure 10) displays a map of the circuit for the Current Lap.

This window is used in conjunction with the Graphs window to relate the graph cursor position to a specific point on the lap.

Clicking on the map moves the map cursor to the point on the track closest to the mouse click. This also moves the graph cursor to the same point.

Figure 10 - Circuit Map Window

If the Circuit Map window is not currently visible it can be activated in any of the following methods:

- Click the Circuit Map tab next to the Notes tab, or
- Click the Circuit Map button on the main toolbar, or
- Choose **View ➡ Circuit Map** from the main menu.

The buttons on the toolbar immediately below the title bar are enabled whenever a map is displayed and they perform the following:

	Shows/hides segments.
	Allows the segments for the current circuit map to be edited.
	Rotates the map by 90° in a clockwise direction.

To see the name of a button, place the cursor over it without clicking. To execute the command associated with a toolbar button click the button. If a button is greyed out the command is not available.

3.8 Graphs

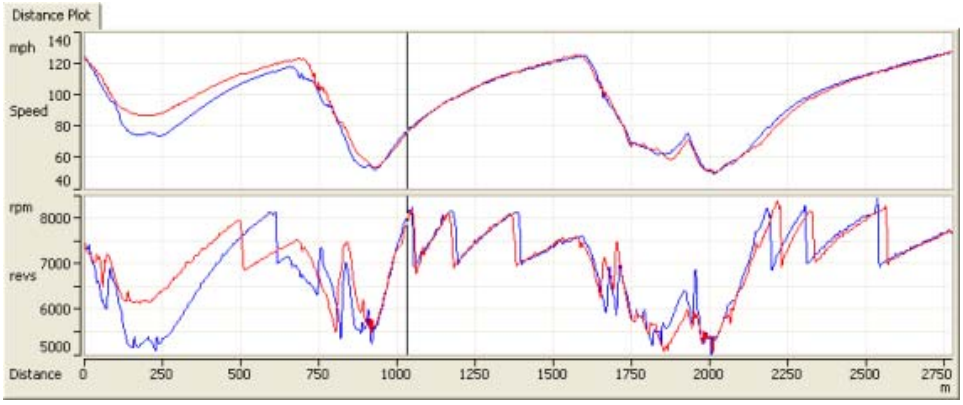


Figure 11 - Graphs Window

The Graphs window (Figure 11) displays logged values for a lap against either distance or time. This window is used to plot data for the laps of interest and to compare two laps from the same or different sessions.

Clicking on a graph moves the graph cursor to that point on the graph. This also moves the map cursor to the same point. The values of the displayed parameters at the current cursor position are displayed in the Cursor Values window.

Once the Current Lap has been set or a lap has been highlighted in the Lap Explorer window a graph of any of the logged parameters is displayed using either of the following methods:

- Activate the graphs drop down menu by clicking on the arrow ▾ next to the Graphs button on the main toolbar and select the parameter to display, or
- Choose **View ➡ Graphs** from the main menu and select the parameter required.

3.9 Histograms

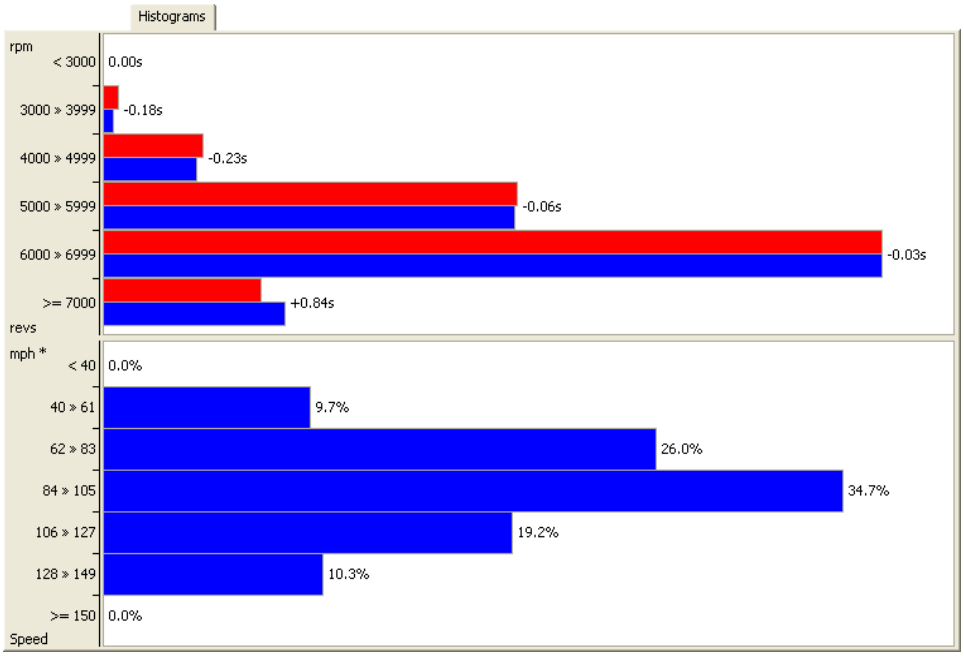


Figure 12 - Histograms Window

The Histograms Window (Figure 12) displays logged data for a lap as a bar graph. This window is used to examine the frequency of various ranges of values for the channels of interest.

Once the Current Lap has been selected or a lap has been highlighted in the Lap Explorer window a histogram of any of the logged parameters is displayed using either of the following methods:

- Activate the histograms drop down menu by clicking on the arrow ▾ next to the Histograms button on the main toolbar and select the parameter to display, or
- Choose **View ➡ Histograms** from the main menu and select the parameter required.

3.10 X-Y Plots

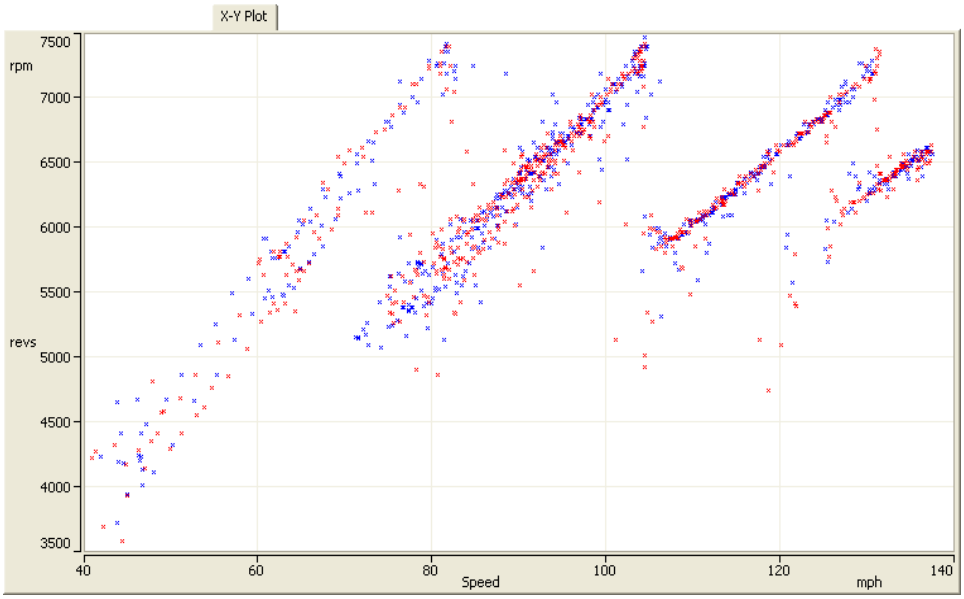


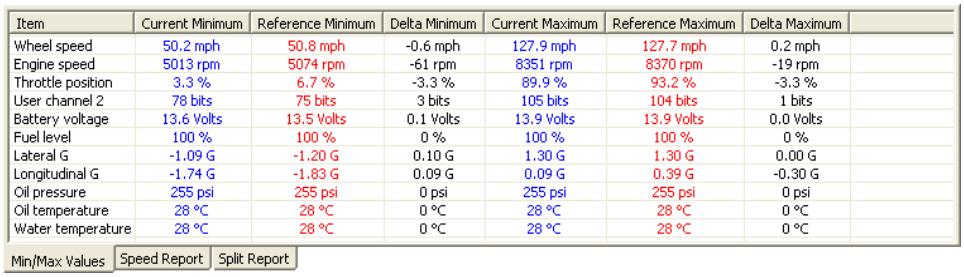
Figure 13 - X-Y Plot Window

The X-Y Plot Window (Figure 13) displays a graph for two channels plotted one against the other. This window is used to examine the relationship between the two channels of interest.

Once the Current Lap has been selected or a lap has been highlighted in the Lap Explorer window an X-Y plot of any of the in-built styles is displayed using either of the following methods:

- Activate the X-Y plot drop down menu by clicking on the arrow ▾ next to the X-Y Plots button on the main toolbar and select the style of plot to display, or
- Choose **View ➡ X-Y Plots** from the main menu and select the style of plot required.

3.11 Reports



Item	Current Minimum	Reference Minimum	Delta Minimum	Current Maximum	Reference Maximum	Delta Maximum
Wheel speed	50.2 mph	50.8 mph	-0.6 mph	127.9 mph	127.7 mph	0.2 mph
Engine speed	5013 rpm	5074 rpm	-61 rpm	8351 rpm	8370 rpm	-19 rpm
Throttle position	3.3 %	6.7 %	-3.3 %	89.9 %	93.2 %	-3.3 %
User channel 2	78 bits	75 bits	3 bits	105 bits	104 bits	1 bits
Battery voltage	13.6 Volts	13.5 Volts	0.1 Volts	13.9 Volts	13.9 Volts	0.0 Volts
Fuel level	100 %	100 %	0 %	100 %	100 %	0 %
Lateral G	-1.09 G	-1.20 G	0.10 G	1.30 G	1.30 G	0.00 G
Longitudinal G	-1.74 G	-1.83 G	0.09 G	0.09 G	0.39 G	-0.30 G
Oil pressure	255 psi	255 psi	0 psi	255 psi	255 psi	0 psi
Oil temperature	28 °C	28 °C	0 °C	28 °C	28 °C	0 °C
Water temperature	28 °C	28 °C	0 °C	28 °C	28 °C	0 °C

Min/Max Values | Speed Report | Split Report

Figure 14 - Reports Window

The Reports window (Figure 14) displays tabular data for the currently selected laps or session. This window is used to compare laps in more detail.

Once the Current Lap has been selected or a lap has been highlighted in the Lap Explorer window any of the available reports can be selected using either of the following methods:

- Activate the reports drop down menu by clicking on the arrow ▾ next to the Reports button on the main toolbar and selecting the report to display, or
- Choose **View ➡ Reports** from the main menu and select the report required.

3.12 Status Bar

Figure 15 - Podium Plus Status Bar

The Status Bar (Figure 15) identifies the laps for which data is currently being displayed together with the colours used.

3.13 Resizing Windows

The relative proportions of the various windows can be altered to suit the data being displayed.

To adjust the position of the line dividing two windows do the following:

1. Move the mouse over the space between the two windows until the mouse pointer changes shape.
2. Drag the dividing line to the required position. The windows either side of the dividing line will be redrawn to fill their new boundaries when the mouse button is released.

3.14 Command Reference

The following commands are available:

Menu Command	Keyboard Shortcut	Toolbar Button	Section
File Menu	**Alt + F**		
Download	-		4.1
Export	-		9.7
Page Setup	-	-	11.3.4
Print Preview	-		11.3.3
Print	-		11.3
Save Layout on Exit	-	-	11.2
Exit	-	-	2.7
Edit Menu	**Alt + E**		
Beacon Position	-	-	6
Session Details	-	-	4.3
View Menu	**Alt + V**		
Zoom In	-		6.5
Zoom Out	-		6.6
Lap Explorer	-		3.4
Cursor Values	-		3.5
Notes	-		3.6
Circuit Map	-		3.7 & 10
Select Output	-	-	11.1
Graphs	-		3.8 & 6
Reports	-		3.11 & 9
Histograms	-		3.9 & 7
X-Y Plots	-		3.10 & 8
Map Menu	**Alt + M**		
New	-	-	10.1
Edit Segments	-	(Circuit Map)	10.2
Rotate	-	(Circuit Map)	10.4

Menu Command	Keyboard Shortcut	Toolbar Button	Section
Setup Menu	**Alt + S**		
Data Logger	-	-	12.1
Show Setup For Session	-	-	12.2
Upload Hex File	-	-	12.6
Channels	-	-	12.3
Serial Port	-	-	12.4
Graph Colours	-	-	12.5
Map Colours	-	-	12.5
Help Menu	**Alt + H**		
Help Topics	F1		-
About PolyLogic Podium Plus	-	-	-
Licences	-	-	2.7

3.15 Context Menus

Context (or “pop-up”) menus are available on a number of controls in the user interface.

An option is selected from a context menu in the following way:

1. Move the mouse over the control.
2. Click the right mouse button to display the context menu.
3. Select the option you require by clicking it.
4. You can cancel a context menu by pressing **Esc** or clicking outside of the menu frame.

The following sections describe the context menus available.

3.16 Lap Explorer Context Menu

All nodes in the Lap Explorer have context menus and these provide access to additional features.

3.16.1 Root Node

Download	Initiates the process of downloading data from the SWIS10 (see Section 4.1).
New Circuit	Creates a new circuit node in the Lap Explorer tree (see Section 4.6).
Import Session	Imports session data from an alternative location (see Section 4.5).

3.16.2 Circuit Node

Download	Initiates the process of downloading data from the SWIS10 (see Section 4.1).
Rename	Allows the circuit name to be edited (see Section 4.7).
Delete	Deletes the circuit and all the sessions it contains (see Section 4.8).

3.16.3 Session Node

Rename	Allows the session name to be edited (see Section 4.9).
Delete	Deletes the session (see Section 4.11).
Export	Copies the session data to an alternative location, i.e. for archival or transfer to another computer (see Section 4.4).
Edit Details	Allows the session details to be edited (see Section 4.3).
Beacon Position	Allows the position of the beacon to be edited for this session (see Section 4.2).
Show Setup for Session	Displays the details for the highlighted session (see Section 12.2).

3.16.4 Lap Node

Current Lap	Sets the highlighted lap as the Current Lap (see Section 5.1).
Reference Lap	Sets the highlighted lap as the Reference Lap (see Section 5.2).
Create Map	Starts the process of defining a circuit map using the data for the highlighted lap (see Section 10.1).
Notes	Displays notes for the lap.

3.17 Graph Context Menu

Each graph pane has a context menu which contains the following options:

Close	Removes the graph (see Section 6.3).
Zoom In	Expands the graph around the current cursor position (see Section 6.5).
Zoom Out	Contracts the graph around the current cursor position (see Section 6.6).
Time	Changes the graph X axis to time (see Section 6.7).
Distance	Changes the graph X axis to distance (see Section 6.7).
Channel	Allows the channel for the selected graph to be changed (see Section 6.2).
Filtered	Adds or removes filtering for the graph (see Section 6.8).
Autofit	For channels that contain only positive values, alternately expands the Y axis to fit the data or sets the Y axis minimum value to zero (see Section 6.9).
Cursor Values	Displays the cursor values window (see Section 6.10).
Settings	Allows the settings for the input channel to be edited (see Section 6.11).
Graph Colours	Allows the graph colours to be altered (see Section 12.5).
Print	Prints the currently displayed graphs (see Section 6.12).

3.18 Histogram Context Menu

Each histogram panel has a context menu which contains the following options:

Close	Removes the histogram (see Section 7.3)
Channel	Allows the channel for the selected histogram to be changed (see Section 7.2).
Filtered	Adds or removes filtering for the histogram (see Section 7.5).
Settings	Allows the settings for the input channel to be edited (see Section 7.6).
Properties	Allows the properties for the histogram to be changed (see Section 7.4).
Graph Colours	Allows the graph colours to be altered (see Section 12.5).
Print	Prints the currently displayed histograms (see Section 7.7).

3.19 X-Y Plot Context Menu

The X-Plot pane has a context menu which contains the following options:

Close	Removes the X-Y plot (see Section 8.3).
Style	Allows the style of the X-Y plot to be changed (see Section 8.2).
Graph Colours	Allows the graph colours to be altered (see Section 12.5).
Print	Prints the X-Y plot (see Section 8.4).

3.20 Report Context Menu

Each report pane has a context menu which contains the following options:

Close	Removes the report (see Section 9.6).
Style	Allows the style of the selected report to be changed (see Section 9.5).
Export to Excel	Transfers the contents of the report to a comma separated variable (CSV) file that can be imported into Microsoft Excel (see Section 9.7).
Print	Prints the report (see Section 9.8).

3.21 Circuit Map Context Menu

The circuit map panel has a context menu which contains the following options:

Show Segments	Toggles the display of circuit map segments (see Section 10.3).
Edit Segments	Allows the circuit map segments to be edited (see Section 10.2).
Rotate Map	Rotates the map clockwise in 90° increments (see Section 10.4).
Map Colours	Allows the circuit map and segment colours to be changed (see Section 12.5).
Print	Prints the circuit map (see Section 10.5).

4 Managing Session Data

This chapter describes how Podium Plus allows you to download and manage data logged by the Farringdon Instruments SWIS10-3 steering wheel instrumentation system.

4.1 Downloading Session Data

Before any analysis can be performed, the logged data must be transferred from the data logger to the hard disk of the host computer. This process, referred to as downloading, is straightforward and is achieved in the following way:

1. Click the Download button on either the main toolbar or the Lap Explorer tool bar, or select **File ➡ Download** from the main menu, or select the **Download** option from the context menu attached to the root or circuit node. The Session Data Download dialog (Figure 16) appears.

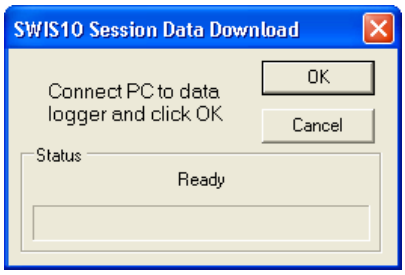


Figure 16 - Session Data Download Dialog (Idle)

2. Connect the data logger to the serial port of the host computer using the cable provided and click **OK**. The process of transferring the data from the data logger to the host computer will start.

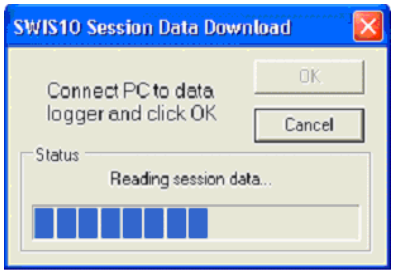


Figure 17 - Session Data Download Dialog (Downloading)

3. When the data has been successfully transferred the Save Session Data dialog (Figure 18) appears. Podium Plus will populate the Session field with a unique identifier for this session based on the current date. Other fields will be set to the values used previously.

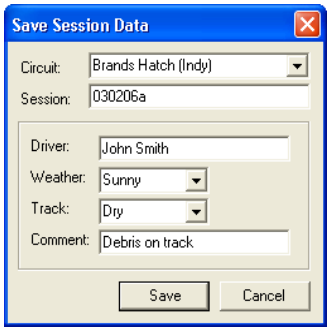


Figure 18 - Save Session Data Dialog

4. Update the fields to reflect the prevailing conditions and add a comment if necessary. Note that the Driver, Weather, Track, and Comment fields are all optional but the Circuit and Session fields determine where the data is stored so cannot be left blank. If the current circuit is not listed then the name can be typed in. The optional fields can be changed at a later date using the **Edit ➡ Session Details** option from the main menu. See Section 4.3 for more information.

5. When all the required information has been entered click **Save** and the data will be stored on the hard disk of the host computer.

6. The Save Session Data dialog closes and the new session appears highlighted and expanded in the Lap Explorer window.

4.2 Changing the Beacon Position

When using a portable beacon it is not always possible to place the beacon at the same location for each session at a particular track.

Podium Plus provides a mechanism to move the position of the beacon on a session-by-session basis so that all sessions for a track can have a common start point.

The beacon position for a session is changed in the following way:

1. Highlight the session (or any lap within the session) in the Lap Explorer window.

2. Select **Edit ➡ Beacon Position** from the main menu, or select the **Beacon Position** option from the context menu attached to the session node. The Edit Beacon Position dialog (Figure 19) appears.

Figure 19 - Edit Beacon Position Dialog

3. Enter the required beacon offset in m and indicate whether the beacon position is to be moved forwards or backwards from its current point. Clicking **Reset** sets the offset to zero.

4. Click **Save** to update the session. All laps in the session will now use the revised beacon position. Click **Cancel** to leave the beacon offset unchanged.

4.3 Changing Session Details

The details associated with a session may be changed in the following way:

1. Highlight the session (or any lap within the session) in the Lap Explorer window.

2. Select **Edit ➡ Session Details** from the main menu, or select the **Edit Details** option from the context menu attached to the session node. The Edit Session Details dialog (Figure 20) appears.

Figure 20 - Edit Session Details Dialog

3. Enter the new details for the session.

4. Click **Save** to update the session or **Cancel** to leave the session details unchanged.

4.4 Exporting Session Data

Session data can be copied to another location using the context menu attached to each session node in Lap Explorer.

To export a session do the following:

1. Activate the context menu for the session to be exported in the Lap Explorer window.
2. Select the **Export** option, the Export Session File dialog appears.
3. Enter the location to export the session file to and click **OK**.

A second file, an XML file, is created and stored with the exported session data file. This ensures that the details for the session (i.e. driver, weather conditions, etc) can be retained when the session is imported back into Podium Plus.

4.5 Importing Session Data

Exported session data can be imported using the context menu attached to the root node in Lap Explorer.

To import a session do the following:

1. Activate the context menu for the root node in the Lap Explorer window.
2. Select the **Import** option, the Import Session File dialog appears.
3. Locate the file to be imported and click **Open** to select it or **Cancel** to abandon the session import operation.
4. Enter the circuit and details for the new session and click **OK** or click **Cancel** to abandon the session import operation.

4.6 Adding New Circuits

New circuits can be added using the context menu attached to the root node in Lap Explorer.

To add a new circuit do the following:

1. Activate the context menu for the root node in the Lap Explorer window.
2. Select the **New Circuit** option, the New Circuit dialog (Figure 21) appears.

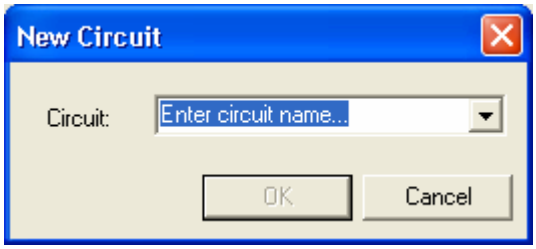


Figure 21 - New Circuit Dialog

3. Type the name of the new circuit or select it from the drop-down list. Click **OK** to create the new circuit or Cancel to close the dialog without creating a new circuit.

4.7 Renaming Circuits

Circuits can be renamed using the context menu attached to each circuit node in Lap Explorer.

To rename a circuit do the following:

1. Activate the context menu for the circuit to be renamed in the Lap Explorer window.

2. Select the **Rename** option, the circuit node name remains highlighted and can be edited.

3. Enter the new name for the circuit and press **Enter** or press **Esc** to leave the circuit name unchanged.

4.8 Deleting Circuits

Circuits can be deleted using the context menu attached to each circuit node in Lap Explorer.

To delete a circuit do the following:

1. Activate the context menu for the circuit to be deleted in the Lap Explorer window.

2. Select the **Delete** option, a message box is displayed that requests confirmation of the delete operation.

3. Press **Yes** to delete the circuit and all the sessions it contains or **No** otherwise.

Alternatively you can highlight the circuit to be deleted in the Lap Explorer window and press the **Delete** key.

4.9 Renaming Sessions

Sessions can be renamed using the context menu attached to each session node in Lap Explorer.

To rename a session do the following:

1. Activate the context menu for the session to be renamed in the Lap Explorer window.
2. Select the **Rename** option, the session node name remains highlighted and can be edited.
3. Enter the new name for the session and press **Enter** or press **Esc** to leave the session name unchanged.

4.10 Moving Sessions

Sessions can be moved to different circuits by dragging them from their current circuit and dropping them on another circuit.

To move a session to a different circuit do the following:

1. Move the mouse over the session to be moved and press the left mouse button.
2. With the left mouse button still pressed, move the mouse over the circuit node you wish to move the session to. The Lap Explorer window will scroll as you move the mouse close to its top and bottom edges.
3. With the mouse over the destination circuit release the left mouse button. A message box requesting confirmation of the move operation will be displayed.
4. Press **Yes** to move the session or **No** to leave it in its original location.

4.11 Deleting Sessions

Sessions can be deleted using the context menu attached to each session node in Lap Explorer.

To delete a session do the following:

1. Activate the context menu for the session to be deleted in the Lap Explorer window.
2. Select the **Delete** option, a message box is displayed that requests confirmation of the delete operation.
3. Press **Yes** to delete the session or **No** otherwise.

Alternatively you can highlight the session to be deleted in the Lap Explorer window and press the **Delete** key.

4.12 Displaying Lap Notes

The Notes window for a lap can be displayed using the context menu attached to each lap node in Lap Explorer.

To display the Notes window for a lap using the context menu do the following:

1. Activate the context menu for the lap you want to display notes for in the Lap Explorer window.
2. Select the **Notes** option, the Notes window becomes visible.

5 Selecting Laps for Analysis

Podium Plus allows data to be plotted for up to two laps at any one time. One lap is designated the Current Lap whilst the other is the Reference Lap. The Reference Lap is typically the fastest lap for a particular session, driver, or circuit and is used as a benchmark against which other laps completed at the same circuit are compared.

5.1 Setting the Current Lap

The Current Lap may be set as follows:

1. Double click the lap in the Lap Explorer window.
2. A graph of wheel speed vs. distance is plotted in the Graphs window and the session and lap details for the new Current Lap are displayed in the status bar. If a circuit map has been defined for this circuit then this will appear in the Circuit Map window.

A lap can also be set as the Current Lap using the context menu attached to each lap node in Lap Explorer.

To set a lap as the Current Lap using the context menu do the following:

1. Activate the context menu for the lap you want to set as the Current Lap in the Lap Explorer window.
2. Select the **Current Lap** option, the highlighted lap becomes the Current Lap and the data display windows are updated accordingly.

Alternatively:

1. Highlight the lap in the Lap Explorer window.
2. Select any type of output (Graph, Histogram, X-Y Plot, or Report) from the main tool bar or the **View** option of the main menu.
3. The chosen output will be displayed and the session and lap details for the new Current Lap are displayed in the status bar. If a circuit map has been defined for this circuit then this will appear in the Circuit Map window.

The colour of the graph lines for the Current Lap can be changed via the **Setup** option of the main menu. See Section 12.5.1 for more information.

5.2 Setting the Reference Lap

The Reference Lap is set as follows:

1. Select a Current Lap and plot data for it as described in Section 5.1.

2. Highlight the lap to use as a Reference Lap in the Lap Explorer.
3. Click the Set Reference button on the Lap Explorer toolbar.
4. The data for the new Reference Lap is shown on all the currently displayed charts and reports. The session and lap details of the new Reference Lap are displayed in the status bar.

A lap can also be set as the Reference Lap using the context menu attached to each lap node in Lap Explorer.

To set a lap as the Reference Lap using the context menu do the following:

1. Activate the context menu for the lap you want to set as the Reference Lap in the Lap Explorer window.
2. Select the **Reference Lap** option, the highlighted lap becomes the Reference Lap and the data display windows are updated accordingly. Note that this option is only available if a Current Lap has already been set.

The colour of the graph lines for the Reference Lap can be changed via the **Setup** option of the main menu. See Section 12.5.2 for more information.

5.3 Clearing the Reference Lap

The Reference Lap is cleared as follows:

1. Highlight any lap in the Lap Explorer window.
2. Click the Clear Reference button on the Lap Explorer toolbar.
3. The lines for the Reference Lap are removed from each graph in the Graphs window and the details of the Reference Lap are removed from the status bar.

6 Graphs

This chapter describes how graphs are produced from stored lap data and how graphs for different laps can be compared.

6.1 Adding Graphs

Graphs are added by either of the following methods:

- Activate the graphs drop down menu by clicking on the arrow ▾ next to the Graphs button on the main toolbar and select the graph to display, or
- Choose **View ➡ Graphs** from the main menu and select the graph required.

6.2 Changing Graphs

The parameter displayed by a graph can be changed in the following way:

1. Activate the context menu attached to the graph to be changed.
2. Select the **Channel** option, a list of the available alternative parameters will be displayed.
3. Select the required parameter.
4. The new parameter will be displayed in place of the original one.

6.3 Removing Graphs

Graphs are removed by either of the following methods:

- Activate the graphs drop down menu by clicking on the arrow ▾ next to the Graphs button on the main toolbar and select the graph to remove, or
- Choose **View ➡ Graphs** from the main menu and select the graph no longer required, or
- Activate the context menu attached to the graph to be removed and select the **Close** option.

6.4 Moving the Graph Cursor

The graph cursor can be moved by clicking or dragging the mouse or by using the following keys:

Action	Result
→	Moves the cursor one sample to the right.
←	Moves the cursor one sample to the left.
Ctrl + →	Moves the cursor 25 samples to the right.
Ctrl + ←	Moves the cursor 25 samples to the left.
Home	Moves the cursor to the start of the graph.
End	Moves the cursor to the end of the graph.

Note that the cursor can only be moved using the keyboard when the Graphs window has the input focus, i.e. immediately after it has been clicked.

6.5 Increasing the Zoom Level

The zoom level can be increased (zoom in) in the following way:

1. Position the graph cursor at the point of interest.
2. Click the Zoom In button on the main tool bar, or select the **View ➡ Zoom In** option from the main menu, or select the **Zoom In** option from the context menu attached to any of the graph panes.
3. The graph will be expanded around the current cursor position.

6.6 Reducing the Zoom Level

The zoom level can be reduced (zoom out) in the following way:

1. Click the Zoom Out button on the main tool bar, or select the **View ➡ Zoom Out** option from the main menu, or select the **Zoom Out** option from the context menu attached to any of the graph panes.
2. The graph will be contracted around the current cursor position.

6.7 Changing the X Axis Parameter

The X axis parameter can be switched from Distance to Time, or vice versa, using any of the following methods:

- Activate the graphs drop down menu by clicking on the arrow ▾ next to the Graphs button on the main toolbar and select the **Time** or **Distance** option, or
- Choose **View ➡ Graphs** from the main menu and select the **Time** or **Distance** option, or
- Activate the context menu attached to any graph pane and select the **Time** or **Distance** option.

When distance is chosen as the X axis parameter and map segments are being displayed the X axis will show the extents of each of the map segments.

The map segment display setting can changed using any of the following methods:

- Click the Map Segments button ↦| on the Circuit Map toolbar. The button will appear to be pressed down if map segments are being displayed.
- Choose **Map ➡ Show Segments** from the main menu. A tick mark (✓) next to the **Show Segments** option indicates that map segments are being displayed.
- Choose the **Show Segments** option from the context menu attached to the circuit map. A tick mark (✓) next to the **Show Segments** option indicates that map segments are being displayed.

Note that circuit map segments need to be defined before they can be displayed. See Section 10.2 for details of defining map segments.

6.8 Filtering Data

Graph data can be filtered using the context menu attached to each graph pane.

To change the filter setting for a graph using the context menu do the following:

1. Activate the context menu for the graph you want to change the filter setting for.
2. A tick mark (✓) next to the **Filtered** option indicates that the data for this graph is being filtered.
3. Select the **Filtered** option to change the filter setting for the graph.

Note that this setting will affect other charts and reports derived from the same input channel.

6.9 Autofitting Data

For graphs that contain only positive values (e.g. engine speed, oil pressure, water temperature) the Y axis can be expanded to fit the data being displayed using the context menu attached to each graph pane.

To change the autofit setting for a graph do the following:

1. Activate the context menu for the graph you want to change the autofit setting for.
2. A tick mark (✓) next to the **Autofit** option indicates that the data for this graph is being expanded to fit the available display area.
3. Select the **Autofit** option to change the autofit setting for the graph.

6.10 Displaying Cursor Values

The cursor values for the graphs can be displayed using the context menu attached to each graph pane.

To display the cursor values using the context menu do the following:

1. Activate the context menu for any of the graphs.
2. Select the **Cursor Values** option, the Cursor Values window is displayed.

6.11 Changing Channel Settings

The channel settings for a graph can be changed using the context menu attached to each graph panel.

To change the settings for a channel using the context menu do the following:

1. Activate the context menu for the graph for which you want to change the channel settings for.
2. Select the **Settings** option, the Setup Channels dialog is displayed. Note that this option is only available for graphs of lateral G, longitudinal G, fuel level, and the two user channels.

Refer to Section 12.3 for more information on channel settings.

6.12 Printing Graphs

Graphs can be printed using the context menu attached to each graph pane.

To print the graphs do the following:

1. Activate the context menu for any graph.
2. Select the **Print** option, the Print dialog will be displayed.
3. Set the printer properties and number of copies as required and click **OK** to print the graphs or **Cancel** to abandon the print operation.
4. A single page printout should be produced showing all the displayed graphs together with the cursor values for the current cursor position and the current circuit map.

Alternatively, all screen output (graphs, histograms, X-Y plots and reports) can be printed by clicking the Print button on the main toolbar, or selecting the **File ➔ Print** option from the main menu.

7 Histograms

This chapter describes how histograms are produced from stored lap data and how histogram data for different laps can be compared.

7.1 Adding Histograms

Histograms are added by either of the following methods:

- Activate the histograms drop down menu by clicking on the arrow ▾ next to the Histograms button on the main toolbar and select the histogram to display, or
- Choose **View ➡ Histograms** from the main menu and select the histogram required.

7.2 Changing Histograms

The parameter displayed by a histogram can be changed in the following way:

1. Activate the context menu attached to the histogram to be changed.
2. Select the **Channel** option, a list of the available alternative parameters will be displayed.
3. Select the required parameter.
4. The new parameter will be displayed in place of the original one.

7.3 Removing Histograms

Histograms are removed by any of the following methods:

- Activate the histogram drop down menu by clicking on the arrow ▾ next to the Histograms button on the main toolbar and select the histogram to remove, or
- Choose **View ➡ Histograms** from the main menu and select the histogram no longer required, or
- Activate the context menu attached to the histogram to be removed and select the **Close** option.

7.4 Setting Histogram Properties

The properties of a histogram can be set in the following way:

1. Activate the context menu attached to the histogram for which the properties are to be set and select the **Properties** option. The Edit Histogram Properties dialog appears (Figure 22).

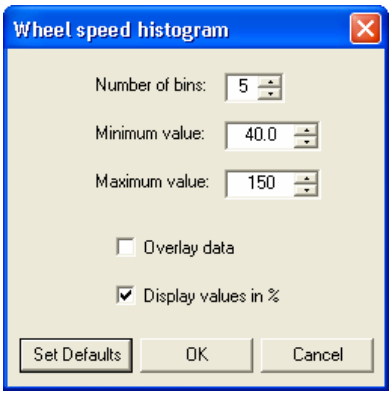


Figure 22 – Edit Histogram Properties Dialog

2. Set the number of bins to the number of histogram 'columns' required bearing in mind that Podium Plus will add a bin to contain the values below the minimum value and another for values above the maximum value.

3. Set the minimum and maximum values to cover the range of values of interest.

4. Check the Overlay Data checkbox if both Current Lap and Reference Lap data are to be displayed on the histogram, leave it unchecked if just the Current Lap data is required. When data for both laps is displayed the difference, rather than the total as a time or percentage, is displayed alongside each histogram bin.

5. Check the Display Values in % checkbox if bin values are to be displayed as a percentage rather than as a time.

6. Clicking the Set Defaults button retrieves the default values for the current histogram style.

7. Click **OK** to update the properties for the histogram or **Cancel** to abandon any changes made.

7.5 Filtering Data

Histogram data can be filtered using the context menu attached to each histogram pane.

To change the filter setting for a histogram using the context menu do the following:

1. Activate the context menu for the histogram you want to change the filter setting for.
2. A tick mark (✓) next to the **Filtered** option indicates that the data for this histogram is being filtered.
3. Select the **Filtered** option to change the filter setting for the histogram.

Note that this setting will affect other charts and reports derived from the same input channel.

7.6 Changing Channel Settings

The channel settings for a histogram can be changed using the context menu attached to each histogram pane.

To change the settings for a channel using the context menu do the following:

1. Activate the context menu for the histogram for which you want to change the channel settings for.
2. Select the **Settings** option, the Setup Channels dialog is displayed. Note that this option is only available for histograms of lateral G, longitudinal G, fuel level, and the two user channels.

Refer to Section 12.3 for more information on channel settings.

7.7 Printing Histograms

Histograms can be printed using the context menu attached to each histogram pane.

To print the histograms do the following:

1. Activate the context menu for any histogram.
2. Select the **Print** option, the Print dialog will be displayed.
3. Set the printer properties and number of copies as required and click **OK** to print the graphs or **Cancel** to abandon the print operation.
4. A single page printout should be produced showing all the displayed histograms.

Alternatively, all screen output (graphs, histograms, X-Y plots and reports) can be printed by clicking the Print button on the main toolbar, or selecting the **File ➔ Print** option from the main menu.

8 X-Y Plots

This chapter describes how X-Y plots are produced from stored lap data and how X-Y plots for different laps can be compared.

8.1 Adding X-Y Plots

X-Y plots are added by either of the following methods:

- Activate the X-Y plots drop down menu by clicking on the arrow ▾ next to the X-Y Plots button on the main toolbar and select the X-Y plot to display, or
- Choose **View ➡ X-Y Plots** from the main menu and select the X-Y plot required.

Note that only a single X-Y plot can be displayed.

8.2 Changing X-Y Plots

The relationship displayed by an X-Y plot can be changed in the following way:

1. Activate the context menu attached to the X-Y plot pane.
2. Select the **Style** option, a list of the available alternative plot styles will be displayed.
3. Select the required plot style.
4. The new relationship will be displayed in place of the original one.

8.3 Removing X-Y Plots

X-Y plots are removed by any of the following methods:

- Activate the X-Y plot drop down menu by clicking on the arrow ▾ next to the X-Y Plots button on the main toolbar and select the current X-Y plot, or
- Choose **View ➡ X-Y Plots** from the main menu and select the current X-Y plot, or
- Activate the context menu attached to the X-Y plot pane and select the **Close** option.

8.4 Printing X-Y Plots

X-Y plots can be printed using the context menu attached to the X-Y plot pane.

To print the X-Y plot do the following:

1. Activate the context menu for the X-Y plot.
2. Select the **Print** option, the Print dialog will be displayed.
3. Set the printer properties and number of copies as required and click **OK** to print the graphs or **Cancel** to abandon the print operation.
4. A single page printout should be produced showing the displayed X-Y plot.

Alternatively, all screen output (graphs, histograms, X-Y plots and reports) can be printed by clicking the Print button on the main toolbar, or selecting the **File ➔ Print** option from the main menu.

9 Reports

Reports are used to summarise important aspects of a specific lap or session. They are a particularly useful way of comparing relative times and speeds when a circuit map has been divided up into segments. This chapter describes how reports are produced from stored data.

9.1 Min/Max Values Report

A min/max values report shows the minimum and maximum values attained for each parameter for the currently selected lap or laps. If both a Current Lap and a Reference Lap have been selected then the difference between each minimum and maximum value is also displayed.

Use either of the following methods to produce a min/max values report:

- Activate the reports drop down menu by clicking on the arrow ▾ next to the Reports button on the main toolbar and select **Min/Max Values**, or
- Choose **View ➡ Reports** from the main menu and select **Min/Max Values**.

9.2 Speed Report

A speed report shows the minimum and maximum speeds for each segment for the currently selected lap or laps. If both a Current Lap and a Reference Lap have been selected then the difference between each minimum and maximum value is also displayed.

Use either of the following methods to produce a speed report:

- Activate the reports drop down menu by clicking on the arrow ▾ next to the Reports button on the main toolbar and select **Speed Report**, or
- Choose **View ➡ Reports** from the main menu and select **Speed Report**.

9.3 Split Report

A split report shows the time taken to complete each segment for each lap in the current session. The theoretical fastest lap time is calculated together with the fastest rolling lap achieved in the session.

The theoretical fastest lap is made up of the fastest time for each segment and these are highlighted in the report. The values of the segments making up the fastest rolling lap are shown in a different text colour.

Use either of the following methods to produce a split report:

- Activate the reports drop down menu by clicking on the arrow ▾ next to the Reports button on the main toolbar and select **Split Report**, or
- Choose **View ➡ Reports** from the main menu and select **Split Report**.

9.4 Summary Report

A summary report shows the highest or lowest value attained by a number of critical channels for each lap in the lap memory of the data logger. The lap memory can hold hundreds such lap summary records so this report is a useful way of spotting potential problems before they occur.

Use either of the following methods to produce a summary report:

- Activate the reports drop down menu by clicking on the arrow ▾ next to the Reports button on the main toolbar and select **Summary Report**, or
- Choose **View ➡ Reports** from the main menu and select **Summary Report**.

9.5 Changing Reports

The report style displayed in a report panel can be changed in the following way:

1. Activate the context menu attached to the report pane.
2. Select the **Style** option, a list of the available alternative report styles will be displayed.
3. Select the new report style.

The new report will be displayed in place of the original one.

9.6 Removing Reports

Use any of the following methods to remove a report:

- Activate the reports drop down menu by clicking on the arrow ▾ next to the Reports button on the main toolbar and select the report to be removed, or
- Choose **View ➡ Reports** from the main menu and select the report to remove, or
- Activate the context menu attached to the report to be removed and select the **Close** option.

9.7 Exporting Reports to Excel

The contents of any of the reports can be exported to a comma separated variable, or CSV, file using the context menu attached to each report. This CSV file can be imported into Microsoft Excel for further analysis.

To export a report to a CSV file do the following:

1. Activate the context menu for the report you want to export.
2. Select the **Export to Excel** option, the Export Report dialog appears.
3. Choose the location and filename for the new file and click **OK** to create it or **Cancel** to abandon the export operation.

You can also use the Export to Excel button on the main toolbar or the **File ➡ Export ➡ Report to Excel** option from the main menu.

9.8 Printing Reports

Reports can be printed using the context menu attached to each report.

To print a report do the following:

1. Activate the context menu for the report to be printed.
2. Select the **Print** option, the Print dialog will be displayed.
3. Set the printer properties and number of copies as required and click **OK** to print the graphs or **Cancel** to abandon the print operation.
4. A printout should be produced showing the displayed report.

Alternatively, all screen output (graphs, histograms, X-Y plots and reports) can be printed by clicking the Print button on the main toolbar, or selecting the **File ➡ Print** option from the main menu.

10 Circuit Mapping

Podium Plus allows a track map to be produced for each circuit for which data has been logged and stored. This chapter describes how circuit maps are produced and how they may be divided up into segments that allow more detailed analysis to be performed.

10.1 Creating a New Circuit Map

A new circuit map is created in the following way:

1. Highlight the lap to use as the basis for the circuit map in the Lap Explorer window.

2. Choose **Map ➡ New** from the main menu or activate the context menu for the lap and select the **Create Map** option. The New Circuit Map dialog (Figure 23) appears.

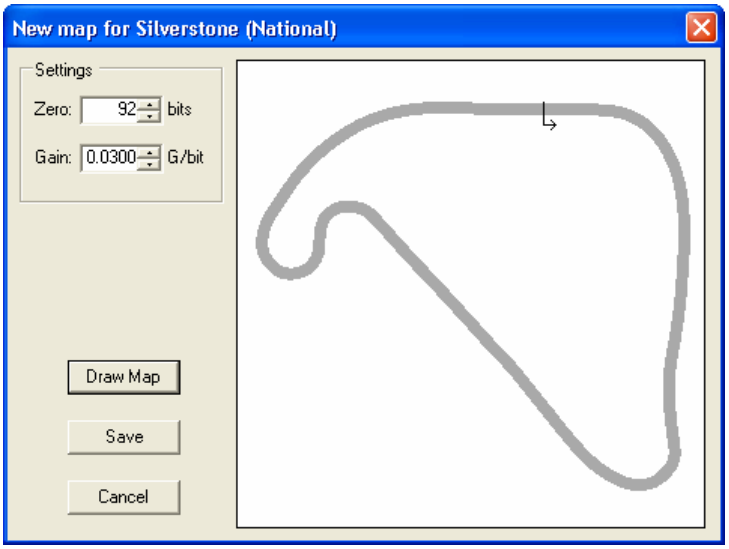


Figure 23 - New Circuit Map Dialog

3. The mapping process produces an approximate map based on the current zero and gain values for the lateral accelerometer. Some adjustment may be necessary to make the plotted map resemble the actual circuit.

4. To make an adjustment alter the zero or gain value and then click **Draw Map**. The circuit map is redrawn using the new settings. Experiment with the zero and gain settings until the map most closely matches the actual layout of the circuit.

5. Click **Save** to make this the default map for this circuit or **Cancel** to abandon any changes made.

10.2 Map Segments

Once a map has been created and stored for a circuit it can then be divided up into segments.

10.2.1 Adding Segments

Segments are added to an existing circuit map in the following way:

1. Highlight the circuit (or any session or lap for the circuit) in the Lap Explorer window.

2. Choose **Map ➡ Edit Segments** from the main menu or select the **Edit Segments** from the circuit map context menu. The Edit Map Segments dialog (Figure 24) appears.

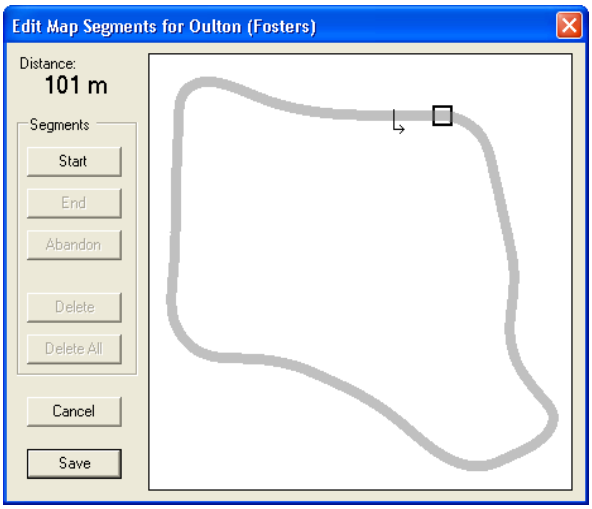


Figure 24 - Edit Map Segments Dialog (No Segments)

3. Mark the start point of the segment by clicking on the map and then clicking **Start**. The start point of the segment is marked with a square drawn in a dashed line (see Figure 25). The **Start** button is disabled and the **End** and **Abandon** buttons are enabled.

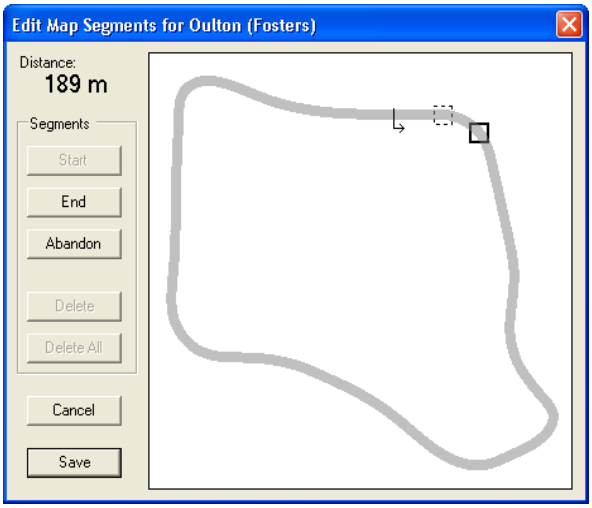


Figure 25 - Edit Map Segments Dialog (Defining a Segment)

4. If you want a segment to start at the end of another segment place the cursor anywhere in the other segment before clicking **Start**.

5. Mark the end point of the segment by clicking on the map and then clicking **End**. The portion of the map between the start and end points changes colour with small bars marking the extents of the segment (see Figure 26). Clicking **Abandon** before marking the end point of a segment allows the definition of the current segment to be cancelled.

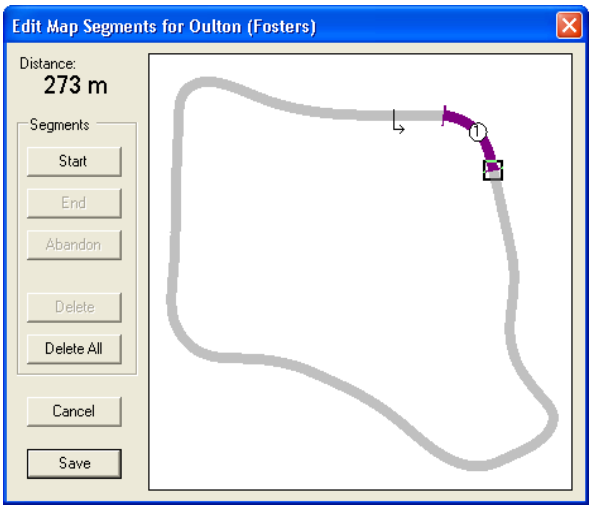


Figure 26 - Edit Map Segments Dialog (Segment Defined)

6. If you want a segment to end at the start of another segment place the cursor anywhere in the other segment before clicking **End**.

7. Continue to define more segments if required.

8. Click **Save** to update the segments for the circuit map or **Cancel** to abandon any changes made.

The Edit Map Segments dialog can also be accessed using the Edit Segments button on the Circuit Map toolbar.

The colours for both the track and the segments can be changed via the **Setup** option of the main menu or the context menu attached to the circuit map pane. See Section 12.5 for more information.

10.2.2 Deleting Segments

Unwanted circuit map segments are deleted in the following way:

1. Highlight the circuit (or any session or lap for the circuit) in the Lap Explorer window.

2. Choose **Map ➡ Edit Segments** from the main menu or select the **Edit Segments** from the circuit map context menu. The Edit Segments dialog appears.

3. Place the cursor over the segment to be deleted by clicking the map anywhere in the segment. The **Delete** button is enabled (see Figure 27).

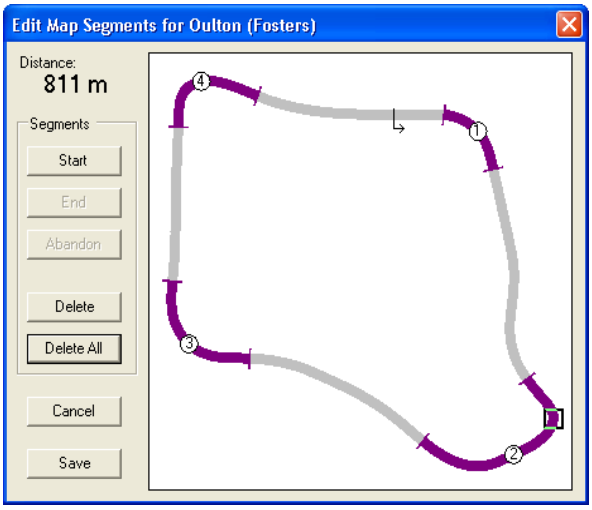


Figure 27 - Edit Map Segments Dialog (Deleting a Segment)

4. Click **Delete**. The segment is removed from the map (see Figure 28).

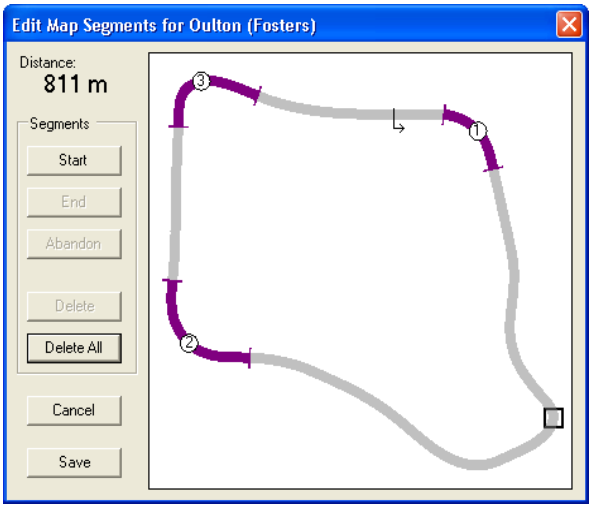


Figure 28 - Edit Map Segments Dialog (Segment Deleted)

5. Click **Save** to update the segments for the circuit map or **Cancel** to abandon any changes made.

10.2.3 Deleting All Segments

All the segments for a circuit map are deleted in the following way:

1. Highlight the circuit (or any session or lap for the circuit) in the Lap Explorer window.

2. Choose **Map ➡ Edit Segments** from the main menu or select the **Edit Segments** from the circuit map context menu. The Edit Segments dialog appears.

3. Click **Delete All**. A message box is displayed which requests confirmation of the delete operation (see Figure 29).

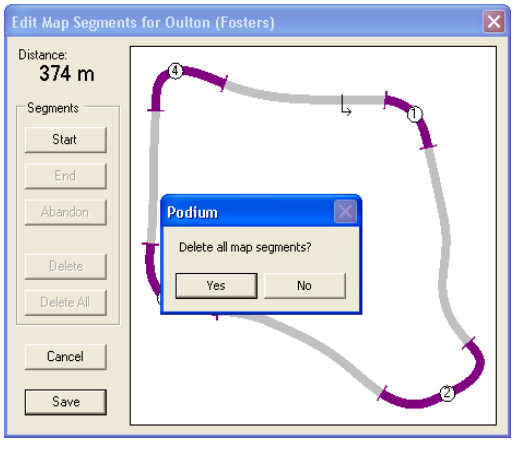


Figure 29 - Edit Map Segments Dialog (Delete All Segments)

4. Click **Yes** to delete all the map segments or **No** otherwise.

5. Click **Save** to update the segments for the circuit map or **Cancel** to abandon any changes made.

10.3 Displaying Map Segments

The display of map segments, for the circuit map and graph X axis, can be controlled in any of the following ways:

- Click the Map Segments button ⟼ on the Circuit Map toolbar. The button will appear to be pressed down if map segments are being displayed.
- Choose **Map ➡ Show Segments** from the main menu. A tick mark (✓) next to the **Show Segments** option indicates that map segments are being displayed.
- Choose the **Show Segments** option from the context menu attached to the circuit map. A tick mark (✓) next to the **Show Segments** option indicates that map segments are being displayed.

10.4 Rotating Circuit Maps

The circuit map can be rotated clockwise in 90° steps in any of the following ways:

- Click the Rotate Map button ↻ on the Circuit Map toolbar.
- Choose **Map ➡ Rotate** from the main menu.
- Choose the **Rotate Map** option from the context menu attached to the circuit map.

10.5 Printing Circuit Maps

Circuit maps can be printed using the context menu attached to the circuit map pane.

To print a circuit map do the following:

1. Activate the context menu for the circuit map to be printed.
2. Select the **Print** option, the Print dialog will be displayed.
3. Set the printer properties and number of copies as required and click **OK** to print the graphs or **Cancel** to abandon the print operation.
4. A printout should be produced showing the displayed circuit map.

Alternatively, all screen output (graphs, histograms, X-Y plots and reports) can be printed by clicking the Print button 🖶 on the main toolbar, or selecting the **File ➡ Print** option from the main menu.

11 Managing Screen Content

Podium Plus provides facilities for managing what appears on the screen. This chapter describes how the screen contents are managed.

11.1 Selecting Screen Output

In addition to selecting graphs, histograms, X-Y plots and reports individually (as described in previous chapters) Podium Plus provides a mechanism to select all the required output at the same time.

Once a Current Lap has been chosen or a lap has been highlighted in Lap Explorer the required screen output can be selected in the following way:

1. Select the **View ➡ Select Output** option from the main menu. The Select Output dialog (Figure 30) appears showing all the currently selected screen output items.

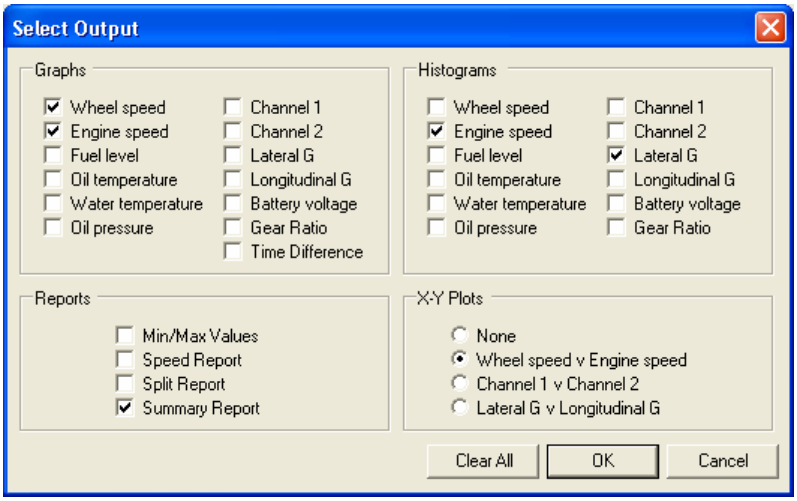


Figure 30 - Select Output Dialog

2. Set the required screen output by checking or unchecking the check boxes alongside each screen output item. The **Clear All** button can be used to deselect all screen output items.

3. Click **OK** to display the selected screen output or **Cancel** to abandon any changes made.

11.2 Saving Screen Layout

Podium Plus allows the screen layout to be saved when the program is terminated. The saved screen layout will be restored when the program is restarted.

To save the screen layout when the program exits do the following:

1. Select the **File ➧ Save Layout on Exit** option from the main menu.
2. A tick mark (✓) next to the **Save Layout on Exit** option indicates that the screen layout will be saved when the program exits. With this option selected the most recent screen layout will be restored when the program is restarted.

11.3 Printing Screen Output

Podium Plus allows all screen output items to be printed and provides several ways of doing this.

11.3.1 Printing Individual Screen Output Items

To print an individual screen output item do the following:

1. Activate the context menu for the item to be printed.
2. Select the **Print** option, the Print dialog will be displayed.
3. Set the printer properties and number of copies as required and click **OK** to print the item or **Cancel** to abandon the print operation.
4. A printout should be produced of the selected screen output item.

11.3.2 Printing All Screen Output

To print all current screen output do the following:

1. Click the Print button on the main toolbar, or select the **File ➧ Print** option from the main menu, the Print dialog will be displayed.
2. Set the printer properties and number of copies as required and click **OK** to print the graphs or **Cancel** to abandon the print operation.
3. A printout should be produced showing all the current screen output.

11.3.3 Previewing Printed Output

To preview the printed version of the screen output before printing it do the following:

1. Click the Print Preview button on the main toolbar, or select the **File ➡ Print Preview** option from the main menu, the Print Preview dialog will be displayed.
2. The Print Preview dialog allows each page of the printout to be viewed and all, or selected pages, of the printout can be printed by clicking the Print button or click **Close** to close the Print Preview dialog without printing anything.

11.3.4 Page Setup

To alter the page setup for printed output do the following:

1. Select the **File ➡ Page Setup** option from the main menu. The Page Setup dialog appears.
2. Change the margin, paper and printer settings as required.
3. Click **OK** to save the changes or **Cancel** to abandon any changes made.

12 Configuration

Podium Plus provides facilities for the SWIS10 steering wheel instrumentation system to be configured via the serial port.

The way in which Podium Plus itself operates can also be configured to suit each particular application or personal taste.

This chapter describes how this configuration is carried out.

12.1 Data Logger

The setup mode of the SWIS10 steering wheel instrumentation system allows a majority of the configurable parameters to be accessed. Podium Plus provides a means of accessing these parameters, together with others not available via the steering wheel.

12.1.1 Reading Current Configuration

Before the configuration of the steering wheel can be changed the current configuration must be downloaded to the host computer. This is achieved in the following way:

1. Choose **Setup ➡ Data Logger** from the main menu. The Configuration Download Dialog (Figure 31) appears.

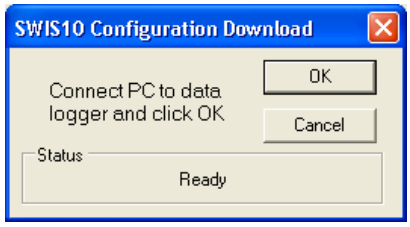


Figure 31 - Configuration Download Dialog

2. Connect the data logger to the serial port of the host computer using the cable provided and click **OK**. The current configuration of the steering wheel is transferred to the host computer and the Setup Data Logger Dialog (Figure 32) appears.

The Setup Data Logger Dialog contains six pages which are described in the following sections.

Note that any configuration changes made in the Setup Data Logger Dialog will only come into effect when they have been transferred back to the steering wheel.

Refer to the SWIS10 User Manual for a more complete description of the purpose of each of the configuration settings.

12.1.2 General

Click the **General** tab to display the General page (Figure 32) of the Setup Data Logger Dialog.

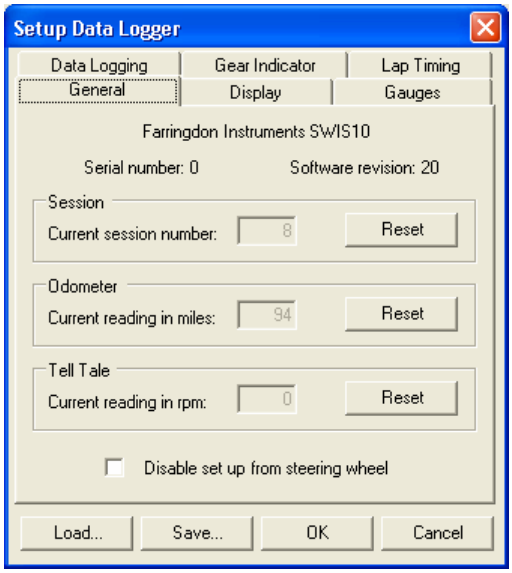


Figure 32 - Setup Data Logger Dialog (General Page)

The model, serial number and software revision of the steering wheel are displayed at the top of the page.

Session The steering wheel maintains a counter that it uses to identify each session.

This counter is incremented each time the steering wheel passes the beacon for the first time after being switched on.

The current session number is displayed.

To reset the session number to zero click **Reset** in the **Session** box.

Odometer The current odometer reading is displayed.

To reset the odometer to zero click **Reset** in the **Odometer** box.

Tell Tale The rpm tell tale records the maximum engine speed value attained in much the same way as a recording tachometer does.

The current rpm tell tale value is displayed.

To reset the rpm tell tale click **Reset** in the **Tell Tale** box.

Disable Setup Check this box if you want to disable the setup mode on the steering wheel. With this option set the steering wheel configuration can only be viewed and altered using Podium Plus.

12.1.3 Lap Timing

Click the **Lap Timing** tab to display the Lap Timing page (Figure 33) of the Setup Data Logger Dialog.

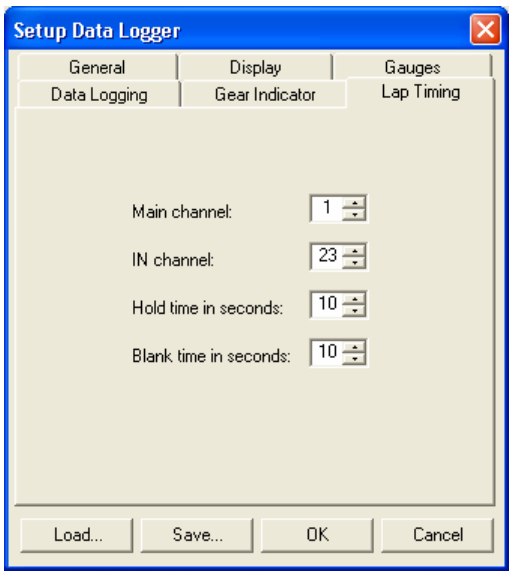


Figure 33 - Setup Data Logger (Lap Timing Page)

Main Channel	Type a number or use the up/down arrows to set the Main Channel value.
IN Channel	Type a number or use the up/down arrows to set the IN Channel value.
Hold Time	Type a number or use the up/down arrows to set the Hold Time value.
Blank Time	Type a number or use the up/down arrows to set the Blank Time value.

12.1.4 Display

Click the **Display** tab to display the Display page (Figure 34) of the Setup Data Logger Dialog.

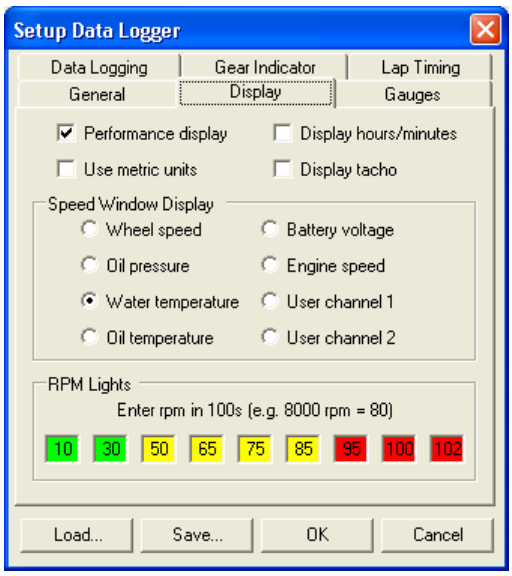


Figure 34 - Setup Data Logger (Display Page)

Performance Display	Check this box if you want to enable the performance display.
Metric Units	Check this box if you want speeds and distances to be displayed in metric units.
Hours/Minutes	Check this box if you want the elapsed time displayed as hours and minutes rather than minutes and seconds.
Tacho	Check this box if you want engine speed displayed in the lap time window.
Speed Window	Choose the parameter you want to be displayed in the speed window.
RPM Lights	Enter the engine speed at which each of the rpm lights should illuminate.

12.1.5 Gauges

Click the **Gauges** tab to display the Gauges page (Figure 35) of the Setup Data Logger Dialog.

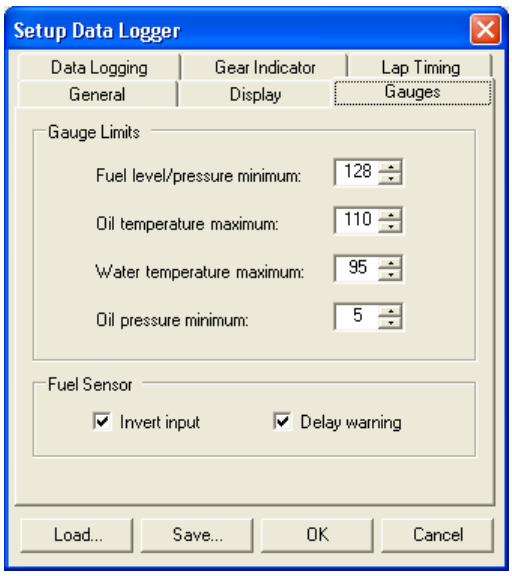


Figure 35 - Setup Data Logger (Gauges Page)

Fuel Minimum	Enter a number or use the up/down arrows to set the fuel level warning value.
Oil Temperature Maximum	Enter a number or use the up/down arrows to set the oil temperature warning value.
Water Temperature Maximum	Enter a number or use the up/down arrows to set the water temperature warning value.
Oil Pressure	Enter a number or use the up/down arrows to set the oil pressure warning value.
Fuel Sensor	Check the **Invert input** box if the fuel level is at it's highest when the sensor reads zero. Check the **Delay warning** box to delay the fuel warning until the fuel level has been below the minimum value for five seconds.

12.1.6 Data Logging

Click the **Data Logging** tab to display the Data Logging page (Figure 36) of the Setup Data Logger Dialog.

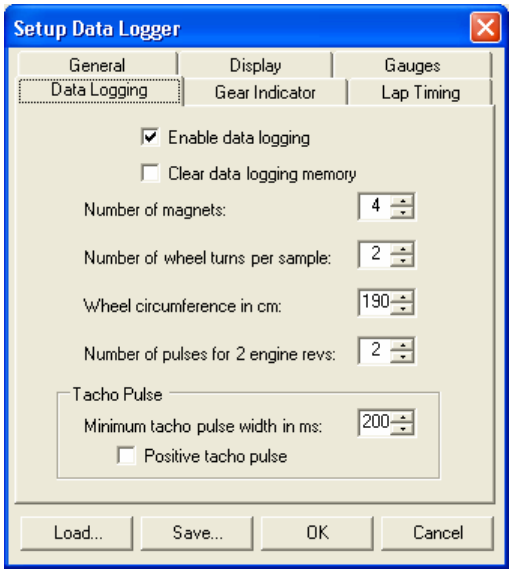


Figure 36 - Setup Data Logger (Data Logging Page)

Number of Magnets	Enter a number or use the up/down arrows to set the number of magnets fitted to the sensing wheel.
Wheel Turns Per Sample	Enter a number or use the up/down arrows to set the number of turns per sample value.
Wheel Circumference	Enter a number or use the up/down arrows to set the wheel circumference value.
Engine Pulses	Enter a number or use the up/down arrows to set the number of sensor pulses for two revolutions of the engine.
Enable Data Logging	Check the box to enable data logging.
Clear Memory	Check the box to clear the data logging memory.

12.1.7 Gear Indicator

Click the **Gear Indicator** tab to display the Gear Indicator page (Figure 37) of the Setup Data Logger Dialog.

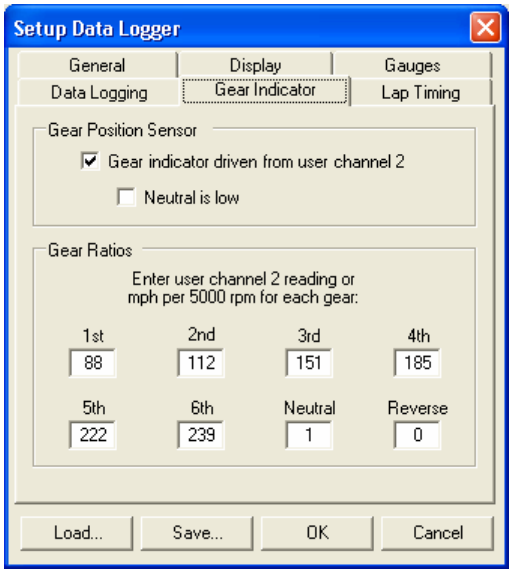


Figure 37 - Setup Data Logger (Gear Indicator Page)

User Channel 2	Check this box if the gear indicator is driven from a sensor connected to user channel 2 rather than being determined from wheel speed and gear ratios.
Neutral Low	Check this box if the sensor output is low when neutral is selected.
Gear Ratios	Enter the user channel 2 reading for each gear or the ratio in mph per 5000 rpm.

12.1.8 Saving Configuration to a File

At any point the **Save** button can be used to store the currently displayed data logger configuration to a file for later use.

12.1.9 Loading Configuration from a File

The **Load** button allows previously saved configuration settings to be re-loaded and transferred to the data logger.

12.1.10 Writing New Configuration

Once all the required changes to the configuration of the steering wheel have been made, click **OK**. The Configuration Upload Dialog (Figure 38) appears.

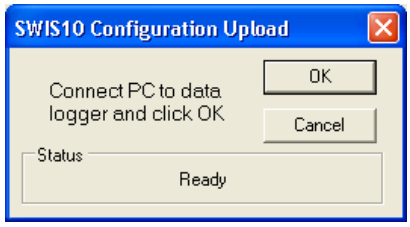


Figure 38 - Configuration Upload Dialog

Verify that the data logger is still connected to the host computer and click **OK**. The updated configuration is transferred to the data logger.

12.2 Show Setup For Session

To examine the data logger configuration used for a session do the following:

1. Highlight the session of interest, or any lap within it, in the Lap Explorer window.
2. Choose **Setup ➡ Show Setup For Session** from the main menu or select the **Show Setup for Session** option in the context menu attached to the session of interest.

The configuration for the chosen session will be displayed using the Setup Data Logger dialog as described above.

12.3 Channels

Podium Plus needs to know how the sensors connected to the SWIS10-3 are configured so that logged data can be displayed correctly.

The sensors are setup (or calibrated) in the following way:

1. Choose **Setup ➡ Channels** from the main menu. The Setup Channels Dialog (Figure 39) appears.
2. Make the necessary changes and click **Apply** to update the current configuration. Click **Cancel** to abandon any changes made.

The Setup Channels Dialog has five pages which are described in the following sections.

12.3.1 Accelerometers

The control box of the SWIS10-3 contains two accelerometers mounted at right angles to each other. One accelerometer measures lateral acceleration and the other measures longitudinal acceleration.

Click the **Accelerometers** tab to display the Accelerometers page (Figure 39) of the Setup Channels Dialog.

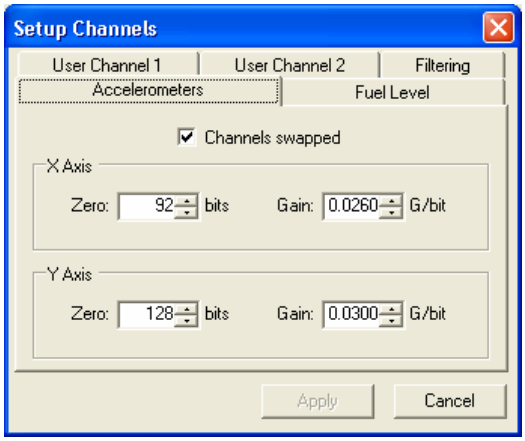


Figure 39 - Setup Channels Dialog (Accelerometers Page)

Channels Swapped Check this box if the control box has been mounted at right angles to it's preferred direction, i.e. the X arrow on the enclosure is aligned with the direction of travel rather than being at right angles to it.

X Axis Enter the zero and gain for the X axis accelerometer.

Y Axis Enter the zero and gain for the Y axis accelerometer.

12.3.2 Fuel Level

Click the **Fuel Level** tab to display the Fuel Level page (Figure 40) of the Setup Channels Dialog.

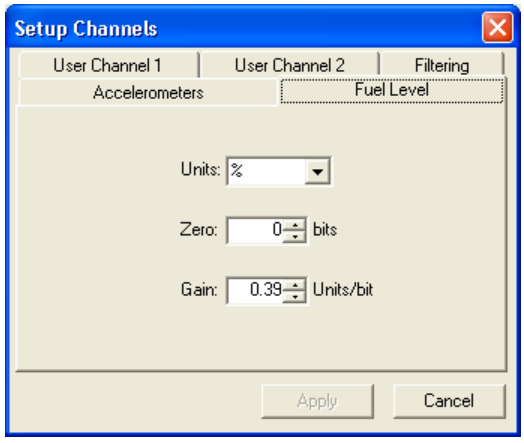


Figure 40 - Setup Channels Dialog (Fuel Level Page)

Units Type in the units of measurement for the fuel sensor or pick an option from the list.

Zero Enter a number or use the up/down arrows to set the zero point of the fuel sensor.

Gain Enter a number or use the up/down arrows to set the gain of the fuel sensor.

12.3.3 User Channels

The two user channels of the SWIS10-3 are configured in the same way so the pages used to set them up are identical. Click the **User Channel 1** tab to display the User Channel 1 page (Figure 41) and the **User Channel 2** tab to display the User Channel 2 page.

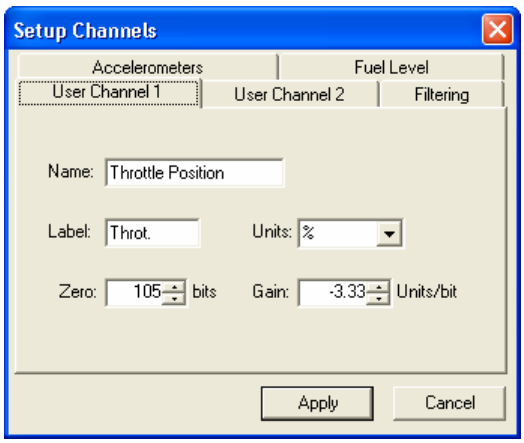


Figure 41 - Setup Channels Dialog (User Channel Page)

Name	Type the name for the user channel.
Label	Type the label to use on the graph axes for the user channel.
Units	Type in the units of measurement for the user channel or pick an option from the list.
Zero	Enter a number or use the up/down arrows to set the zero point of the sensor attached to the user channel.
Gain	Enter a number or use the up/down arrows to set the gain of the sensor attached to the user channel.

12.3.4 Filtering

Click the **Filtering** tab to display the Filtering page (Figure 42) of the Setup Channels Dialog.

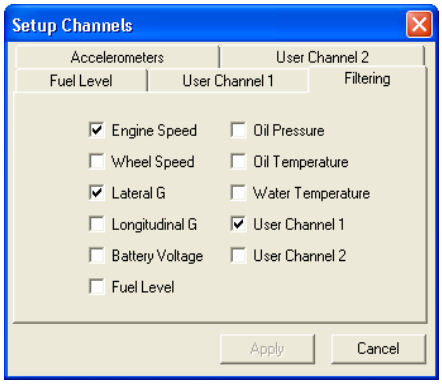


Figure 42 - Setup Channels Dialog (Filtering Page)

Podium Plus uses a simple, but effective, averaging filter to remove noise from logged data.

To filter data for a particular channel, check the box adjacent to the channel name on the Filtering page.

Note that filtering cannot compensate for poor quality data due to electrical noise or poorly mounted sensors. If the data is excessively noisy then filtering may give unpredictable results.

12.4 Serial Port

To alter the serial port that Podium Plus uses to communicate with the SWIS10-3 do the following:

1. Choose **Setup ➡ Serial Port** from the main menu. The Setup Serial Port Dialog (Figure 43) appears.

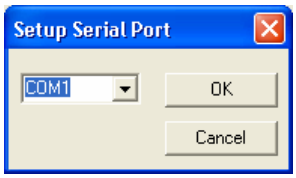


Figure 43 - Setup Serial Port Dialog

2. Select the new serial port from the list.
3. Click **OK** to update the serial port or **Cancel** to leave it unchanged.

12.5 Colours

The colours used to display the graphs, histograms, X-Y plots and circuit map can be changed if required.

In each case, the standard colour dialog (Figure 44) is used to set the new colour. Forty-eight standard colours are available as well as an almost infinite number of user-defined custom colours.

Figure 44 – Standard Colour Dialog

12.5.1 Current Lap Graph

The colour used to display graphs, histograms and X-Y plots for the Current Lap is changed in the following way:

1. Choose **Setup ➡ Graph Colours ➡ Current Lap** from the main menu. The Standard Colour Dialog (Figure 44) appears.

2. Select the new colour for Current Lap graphs and click **OK** or click **Cancel** to leave the colour unchanged.

Alternatively, the colour for the Current Lap can be changed by activating the context menu attached to a graph, histogram or X-Y plot and selecting the **Graph Colours ➡ Current Lap** option.

12.5.2 Reference Lap Graph

The colour used to display graphs, histograms and X-Y plots for the Reference Lap is changed in the following way:

1. Choose **Setup ➡ Graph Colours ➡ Reference Lap** from the main menu. The Standard Colour Dialog (Figure 44) appears.

2. Select the new colour for Reference Lap graphs and click **OK** or click **Cancel** to leave the colour unchanged.

Alternatively, the colour for the Reference Lap can be changed by activating the context menu attached to a graph, histogram or X-Y plot and selecting the **Graph Colours ➡ Reference Lap** option.

12.5.3 Circuit Map Outline

The colour used to display the track outline for the circuit map is changed in the following way:

1. Choose **Setup ➡ Map Colours ➡ Track** from the main menu. The Standard Colour Dialog (Figure 44) appears.

2. Select the new colour for the track outline and click **OK** or click **Cancel** to leave the colour unchanged.

Alternatively, the colour for the track outline can be changed by activating the context menu attached to the circuit map and selecting the **Map Colours ➡ Track** option.

12.5.4 Circuit Map Segments

The colour used to display the map segments for the circuit map is changed in the following way:

1. Choose **Setup ➡ Map Colours ➡ Segments** from the main menu. The Standard Colour Dialog (Figure 44) appears.

2. Select the new colour for the map segments and click **OK** or click **Cancel** to leave the colour unchanged.

Alternatively, the colour for the map segments can be changed by activating the context menu attached to the circuit map and selecting the **Map Colours ➡ Segments** option.

12.6 Uploading Hex Files

The firmware in the SWIS10 control box can be re-programmed via the download port.

The **Setup ➡ Upload Hex File** option from the main menu has been provided to enable this.

IMPORTANT: Do not attempt to upload a hex file to the SWIS10 control box without first contacting Farringdon Instruments and obtaining the correct file for your system.

13 Troubleshooting

Problem	**I can't download data from the steering wheel or read/write its configuration.**
Cause	The steering wheel is not powered up.
Action	Turn on the Master switch, and the ignition switch (if necessary).
Cause	The download lead is not connected.
Action	Connect the data logger to the serial port of the host computer using the cable provided and try again.
Cause	The lead is not making a good connection.
Action	Ensure both connectors are fully home and that the lead is not damaged in any way.
Cause	The serial port is not configured correctly.
Action	Choose **Setup ➡ Serial Port** from the main menu and select the correct serial port.
Problem	**The circuit map doesn't match the track layout.**
Cause	The control box has not been installed in the correct orientation.
Action	Re-position the control box so that the Y arrow is aligned with the direction of travel. If this is not possible, rotate the control box by 90º and choose **Setup ➡ Channels** to check the **Channels Swapped** box on the **Accelerometers** setup page.
Cause	The zero and gain values are incorrect.
Action	Enter the correct zero and gain values and try again.

14 Glossary

Accelerometer	A sensor for measuring acceleration, or the rate of change of speed.
Calibration	The process of scaling logged data into engineering units.
Downloading	The process of transferring stored data from a data logger to a host computer.
Filtering	A mathematical method for removing noise from a graph.
Gain (of sensor)	The relationship between the logged value (in bits) and the physical value (in engineering units).
Lateral G	The sideways acceleration caused by cornering.
Longitudinal G	The fore-aft acceleration caused by accelerating and braking.
Session	Data stored for one or more track outing and downloaded to the host computer.
Zero (of sensor)	The value logged by the data logger when the parameter being measured by the sensor is zero.